REMARKS

After entry of the foregoing amendment, claims 3-15, 18 and 19 remain pending in the application.

Withdrawal of the objection to the drawings is noted with appreciation. Likewise, applicants acknowledge with thanks the withdrawal of certain of the prior art rejections.

The issue concerning claim 7 has been addressed by an amendment to page 6 of the specification, adding the sentence "These blocks may overlap." No new matter is added, as this subject matter was already present in claim 7 as originally filed (as well as in Fig. 1).

Turning to the questioned support for claim 6 (particularly the language that "the watermark decoding operable to decode a watermark that has been embedded redundantly in the image and varies in the image"), reference is made to incorporated-by-reference application 09/503,881 (now patent 6,614,914). This specification details that the encoding is desirably redundant, and varies in the image (e.g., in accord with its perceptual attributes). For example, the issued patent, at column 15, lines 50-52, notes:

> *Recall that the embedder implementation discussed in connection with FIG. 2 redundantly encodes the watermark information signal in blocks of the input signal.*

Likewise, at column 6, lines 11-24, the issued patent notes:

> *A watermark embedder can take advantage of a Human Visual System (HVS) model to determine where to place a watermark and how to control the intensity of the watermark so that chances of accurately recovering the watermark are enhanced, resistance to tampering is increased, and perceptibility of the watermark is reduced. Such perceptual analysis can play an integral role in gain control because it helps indicate how the gain can be adjusted relative to the impact on the perceptibility of the mark. Perceptual analysis can also play an integral role in locating the watermark in a host signal. For example, one might design the embedder to hide a watermark in portions of a host signal that are more likely to mask the mark from human perception.*

The concern regarding claim 7 is believed to be addressed by the earlier-noted amendment to the specification.

The rejection of claims 13-15 over Suzuki (5,621,810) is respectfully traversed.

Suzuki recognizes banknotes by reference to visible, localized patterns thereon (here

the red Bank of Japan seal found on the Japanese 10,000 Yen note). Suzuki is generally understood to operate in a two-step fashion.

In the first step, Suzuki determines the position and orientation of the paper document on the photocopier platen, e.g., by sensing the straight edges associated with the edge of the document. By this procedure, any angular skew and offset of the document is determined. (See, e.g., Suzuki Fig. 1, which shows the determined skew as angle θ, and the determined position by coordinates (X_C, Y_C) at the center of the imaged document.)

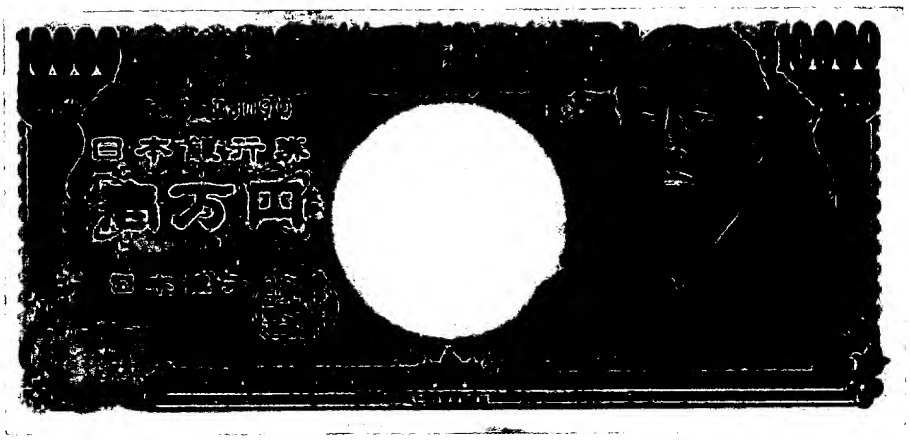
In the second step, Suzuki looks for a characteristic pattern associated with banknotes, taking into account the previously-determined skew and offset. This pattern is expected to occur at one of four known locations within the document, as indicated by regions (X_{S1},Y_{S1}), (X_{S2},Y_{S2}), (X_{S3},Y_{S3}), (X_{S4},Y_{S4}) in Fig. 1. (Four locations are checked since the top/bottom of the bill is uncertain, and the 10,000 Yen note has two seals on each side.)

If the Bank of Japan seal (the "reference pattern") is found within any of the four expected locations, then the original document on the photocopier platen is assumed to be a banknote, and counterfeit deterrent action is taken.

The Suzuki disclosure does not detail precisely what he means by "watermark." The patent makes a reference to the term at col. 8, line 8, indicating that the cross-hatched area in the center of Fig. 1 is the watermarked area.

The watermark referred to here is a conventional paper watermark – of the type that has been formed in fine papers for hundreds of years. The Encyclopedia Britannica (on-line) defines a watermark as a "*design produced by creating a variation in the thickness of paper fibre during the wet-paper phase of papermaking.*"

The Japanese 10,000 yen note about which Suzuki writes is depicted below.



The central blank region is where the watermark is formed in the paper. The back of the note is similarly un-printed in this region:

Suzuki teaches that the red Bank of Japan seal (the small circular region enclosing Japanese characters) is used to identify the scanned object as a banknote (col. 9, lines 39-41). Watermark data is not used to identify the object as a banknote – rather, the watermark is used as a locating device to help locate the Bank of Japan seal.

As detailed in Suzuki, column 8, lines 5-55, the watermark, and the unprinted border of the document, are used as landmarks by which the center and corners of the document – as well as the document skew angle - are determined. From these geometrical data, the locations where the Bank of Japan seal are expected can be determined.

The rejection confuses the paper watermark on the Bank of Japan note, and the red seals. In particular, the rejection (page 8, line 8) refers to "where the red stamp mark (i.e., the watermark) is located."

Suzuki does not select "blocks for watermark decoding based on an analysis of characteristics of the blocks indicating which blocks are likely to have a recoverable watermark signal." He doesn't consider blocks likely to have a recoverable watermark – he is searching for the red seals.

In view of this distinction, other points that may be argued in connection with claim 13 are not belabored. (To emphasize the difference between Suzuki's paper watermark, and applicants' digital watermark, the qualifier "digital" has been inserted before the first reference to 'watermark' in claim 13.)

Claims 14 and 15 are similarly allowable. Additionally, these claims are patentable over Suzuki because that reference does not teach or suggest a watermark decoder incorporated in a printer or scanner driver executing in a computer that is in communication with a printer or scanner peripheral. The cited excerpt of Suzuki does not teach this.

Claims 16, 19 and 20 are said to be anticipated by Ratnakar (6,556,688). Claims 17 and 18 are rejected over Ratnakar in view of Stefik (5,629,980).

(There appears to be a typographical error on page 9 of the Action; the reference to "column 4" at lines 15-16 is understood to refer to "column 6.")

To expedite prosecution, claims 16, 17 and 20 have been canceled, and claims dependent thereon have been rewritten in independent form. (Applicants may continue prosecution of claims like those canceled in a related application.)

The Action dismisses claim 18 by the statement that claim 17 is representative of claim 18. However, closer inspection will show that claim 18 introduce a limitation not found in claim 17. In particular, claim 18 requires that tracer data be encoded into the image in response to detecting a watermark in the image. Neither Ratnakar nor Stefik is understood to teach or suggest such a limitation.

Regarding claim 19, Ratnakar's cited teaching at column 9, lines 61-64, concerns his method for dealing with rotation and offset during decoding – apparently using an exhaustive

search technique. Claim 19, in contrast, concerns encoding. Ratnakar is not understood to teach or suggest any encoding of calibration data into the image during encoding, as claimed.

The rejections of claim 3-12, based on various combinations of Suzuki with Conley (5,689,626), Tillery (6,032,201), Kofune (5,483,069), and/or Rhoads (WO97/43736) are respectfully traversed in view of the points noted earlier concerning Suzuki (e.g., the improper reading of the red stamp mark as a "watermark"). Since a *prima facie* showing under § 103 has not been established for at least these Suzuki-related reasons, other points of traverse are not belabored.

Favorable reconsideration and passage to issuance are solicited.

Respectfully submitted,

Date: June 8, 2004

DIGIMARC CORPORATION

CUSTOMER NUMBER 23735

By_____
William Y. Conwell
Registration No. 31,943

Phone: 503-885-9699
FAX 503-885-9880